

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) An implantable ~~bioelectric signal processing~~ brain state monitoring system comprising:

an interface configured to receive an analog ~~bioelectric~~ brain electrical signal from at least one electrode implanted ~~in said living organism~~ on a subject;

a sigma-delta (Σ - Δ) ~~analog-to-digital converter~~ modulator to convert ~~[[the]]~~ said analog ~~bioelectric~~ brain electrical signal into a 1-bit data stream;

a transceiver coupled to said Σ - Δ ~~analog-to-digital converter~~ modulator, said transceiver configured to communicate said 1-bit data stream to a remote processing system over a wireless communications link;

wherein said 1-bit data is representative of the received analog ~~bioelectric~~ brain electrical signal, which is further filtered and processed in an external processor to extract information about the received signal;

an antenna coupled to a capacitor circuit, for receiving and storing power which is transmitted wirelessly from an external source, said capacitor circuit and antenna configured to indirectly stimulate the process of signal reception from said at least one electrode in response to ~~[[the]]~~ said transmitted power.

2. (Currently Amended) The implantable ~~bioelectric signal processing~~ brain state monitoring system of claim 1 wherein said interface, said ~~Σ - Δ analog-to-digital converter~~ modulator, and said transceiver are disposed within a common matrix configured for implantation within ~~an organism~~ the subject.

3. (Currently Amended) The implantable ~~bioelectric signal processing~~ brain state monitoring system of claim 1 wherein said antenna receives power via RF emission from an electrical winding disposed in proximity to said antenna, said electrical winding configured to receive a controlled flow of electrical current from an external power source to generate an electromagnetic field.

4. (Currently Amended) The implantable ~~bioelectric signal processing~~ brain state monitoring system of claim 3 wherein flow of electric current to ~~[[the]]~~ said electrical winding is controlled by an external signal processing system;

and wherein the external signal processing system triggers ~~[[the]]~~ said implantable system wirelessly, via the controlled flow of electric current to the electrical winding, to start receiving ~~bioelectric~~ brain electrical signals from said ~~organism-subject~~ through at least one implantable electrode disposed within said ~~organism-subject~~.

5. (Canceled)

6. (Currently Amended) The implantable ~~bioelectric signal processing~~ brain state monitoring system of claim 1 wherein said interface, said ~~signal sampling circuit~~ Σ - Δ modulator, and said transceiver are implemented on a single integrated circuit.

7. (Currently Amended) The implantable ~~bioelectric signal processing~~ brain state monitoring system of claim 6 wherein said single integrated circuit utilizes Very Large Scale Integrated circuit architecture.

8. (Currently Amended) The implantable ~~bioelectric signal processing~~ brain state monitoring system of claim 1 wherein said interface includes a signal amplification component for amplifying said received analog ~~bioelectric~~ brain electrical signal.

9-11. (Canceled)

12. (Previously Presented) A biological organism data acquisition system including:

an implantable logic circuit configured for implantation in an organism;

an electrical winding disposed in proximity to said organism, said electrical winding configured to receive a controlled flow of electrical current from an electrical power source and to generate an electromagnetic field;

an external signal processing system operatively coupled to said implantable logic circuit via a wireless interface, said external signal processing system configured to control a flow of electrical power to said implantable logic circuit through said electrical winding and generated electromagnetic field via an air interface;

wherein said implantable logic circuit is coupled to receive analog bioelectric signals from said organism through at least one implantable electrode disposed within

said organism, and to communicate data associated with said analog bioelectric signals to said external signal processing system via a wireless communications link; and

further including an organism containment cage, said electrical winding disposed in proximity to said organism containment cage to generate an electromagnetic field within said organism containment responsive to said controlled flow of electrical current from said electrical power source.

13. (Currently Amended) A method for acquiring ~~bio-electric~~ brain electrical signals from ~~an organism~~ a subject, the method comprising the steps of:

implanting at least one electrode in the ~~organism~~ subject, said electrode configured to acquire at least one ~~bio-electric~~ brain electrical signal;

implanting a logic circuit in the ~~organism~~ subject, said implanted logic circuit coupled to said electrode to receive said acquired ~~bio-electric~~ brain electrical signal;

providing electrical power to said implanted logic circuit from an external power source using wireless energy transfer;

receiving, responsive to said provided power, said at least one ~~bio-electric~~ brain electrical signal at said logic circuit from said implanted electrode; [[and]]

converting said brain electrical signal to a 1-bit data stream using a sigma-delta modulator provided in said implanted logic circuit; and

communicating a said 1-bit data stream representative of said received ~~bio-~~
~~electric~~ brain electrical signal from said implanted logic circuit to an external data
processor via a wireless communications link.

14-16. (Canceled).

17. (Currently Amended) The method of claim 13 wherein said received ~~bio-electric~~
brain electrical signal is ~~a continuous-spontaneous~~ ~~bio-electric~~ brain electrical signal.

18. (Currently Amended) The method of claim 13 wherein said received ~~bio-electric~~
brain electrical signal is ~~an-evoked~~ ~~bio-electric~~ potential signal.

19. (Previously presented) The method of claim 13 wherein said step of providing
electrical power to said implanted logic circuit includes transferring electrical power from
said external power source to said implanted logic circuit over a wireless interface.

20. (Previously presented) The method of claim 13 wherein said step of providing
electrical power to said implanted logic circuit includes generating an electro-magnetic
field with said external power source;

disposing said implanted logic circuit within said electromagnetic field; and
extracting electrical power from said electro-magnetic field at said implanted logic
circuit.